

CLAIMS

1. A gearbox, particularly for transmission systems in devices (2) for metering granular and/or materials in powder form, comprising a pair of shafts, that is, a drive-input shaft (5) and a drive-output shaft (6), respectively, there being provided on the output shaft (6) at least one pair of coaxial freewheels (8), on each of which an end of a respective linkage (10) carrying a movable fulcrum means is active, the opposite end of each linkage being driven with a reciprocating oscillatory motion about the fulcrum means by an eccentric device provided on the drive-input shaft (5) in order to convert the reciprocating oscillatory motion into an intermittent rotary motion of each freewheel (8) and consequently to bring about a rotary motion of the drive-output shaft (6) in a preselected direction of rotation, characterized in that the drive-input shaft (5) comprises at least one pair of cranks with eccentric pins (11) and each linkage (10) comprises a respective element (13) substantially similar to a connecting rod having a first end (13a) connected kinematically to the corresponding freewheel (8) and a second, opposite end (13b) articulated on the respective pin (11) of the crankshaft (5) with a capability for rotary/translational movement relative to the pin (11).
2. A gearbox according to Claim 1 in which guide means are provided on each of the connecting-rod elements (13) for guiding the second connecting-rod end (13b) on the respective pin (11) of the crankshaft (5) during the eccentric rotary motion of the pins (11) relative to the axis of rotation (X) of the drive-input shaft (5).
3. A gearbox according to Claim 2 in which the guide means comprise, on each connecting-rod element (13), a respective elongate slot-like portion (16) which can be engaged slidably by the corresponding pin (11).

4. A gearbox according to Claim 3 in which the slot-like portion (16) is elongate in a direction transverse the axis of rotation (X) of the drive-input shaft (5) of the gearbox.
5. A gearbox according to Claim 3 or Claim 4 in which the slot-like portion (16) is open at the second end (13b) of the connecting-rod element (13).
6. A gearbox according to Claim 5 in which the open slot-like portion (16) is defined by a pair of opposed, parallel and spaced-apart walls (16a, 16b) between which the corresponding pin (11) of the drive-input crankshaft (5) is guided slidably.
10. 7. A gearbox according to Claim 6 in which at least one sliding block (17) is interposed between the walls (16a, 16b) of the slot (16) and the pin (11), the sliding block (17) having a first surface (17a) and a second surface (17b) which are in sliding contact with the walls of the slot (16) and with the pin (11), respectively.
15. 8. A gearbox according to one or more of the preceding claims in which the eccentric pins (11) provided in the cranks of the drive-input shaft (5) are offset by 180° relative to the axis of rotation (X) of the shaft (5).
9. A gearbox according to one or more of the preceding claims in which each of the freewheels (8) comprises an inner ring (8a) keyed to the drive-output shaft and an outer ring (8b) coaxial therewith and capable of rotating freely or with torque transmission, depending on the direction of relative rotation of the rings, each connecting-rod element (13) being articulated, at the first end (13a), to a collar portion (9) fitted on the outer ring (8b) and fixed for rotation therewith.
20. 25. 10. A gearbox according to one or more of the preceding claims in which the movable fulcrum means comprises, for each connecting-rod element (13), a respective fulcrum pin (18) having a first end (18a) restrained on a stationary

structure of the gearbox and an opposite, second end (18b) restrained on the corresponding connecting-rod element (13) to constitute the centre of the rotation of the connecting rod during the reciprocating oscillatory motion relative to the drive-input shaft (5), the fulcrum pins (18) being movable, in 5 adjustable manner, between the opposite ends (13a, 13b) of the connecting rod so as to define different lever arms (B1, B2) between the ends and consequently to adjust the transmission ratio between the drive-input shaft (5) and the drive-output shaft (6) of the gearbox.

11. A gearbox according to Claim 10 in which the first end (18a) of the fulcrum pin (18) is guided slidably in a wall of a casing constituting the gearbox housing (3), the second end (18b) of the fulcrum pin being engaged rotatably and slidably in a seat (21) formed in the corresponding connecting-rod element (13).

12. A gearbox according to Claim 11 in which the second end (18b) of the fulcrum pin is guided in the seat (21) with the interposition of a sliding block (21a) engaged slidably in the seat (21) and coupled rotatably with the pin (11).

13. A gearbox according to Claim 11 or Claim 12 in which the seat (21) extends from the first end (13a) of the connecting rod towards the second, 20 opposite end (13b) of the connecting rod.

14. A gearbox according to one or more of Claims 10 to 13 in which actuator means are provided and are active on the fulcrum pins (18) in order to move the position of the fulcrum relative to the connecting rod in an adjustable manner correlated with the preselected transmission ratio between the drive-input shaft (5) and the drive-output shaft (6) of the gearbox.

15. A gearbox according to Claim 14 in which the actuator means comprise, for each fulcrum pin (18), a lever mechanism (23) a free end of which is fixed.

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for rotation with a control shaft (24) and which is articulated on the fulcrum pin (18) with a capability for rotary/translational movement between the fulcrum pin (18) and the lever mechanism (23).

16. A gearbox according to Claim 15 in which each fulcrum pin (18) is restrained on the respective lever mechanism (23) with the interposition of a sliding block (26) engaged slidably in a seat (27) of the lever mechanism and coupled rotatably with the fulcrum pin (18).

17. A metering device for the metered delivery of granular and/or materials in powder form, particularly for machines for dispensing the said materials, comprising a gearbox formed in accordance with one or more of the preceding claims for controlling transmission to respective metering members.

18. An agricultural sowing machine comprising a metering device for the metered delivery of granular seed, formed in accordance with Claim 17.